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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,556	07/02/2003	David J. Mount	SCF02P-CON	3605

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EXAMINER	
CARRILLO, BIBI SHARIDAN	
ART UNIT	**PAPER NUMBER**
1746	

DATE MAILED: 11/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

C

Office Action Summary	Application No.	Applicant(s)	
	10/612,556	MOUNT, DAVID J.	
	Examiner	Art Unit	
	Sharidan Carrillo	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) *1-6 and 12-14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) ~~*1-6 and 12-14*~~ *1-14* are subject to restriction and/or election requirement. BSC 11/10/06

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/14/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 7-11 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for cleaning wafers, does not reasonably provide enablement for cleaning any type of substrate. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The claims embrace an invention which contains any known substrate, which could/can be selected from literary thousands. It does not appear to be feasible that any substrate would function in the present invention. Further, for one skilled in the art to reproduce the present invention (which must be possible, if the specification is adequate), there would clearly be undue experimentation to do so in an attempt to figure out which substrates work and which ones do not.

3. Claims 7-11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification of page 17, lines 18-30 teaches that during the pressurization step, the chamber is increased to a pressure of 800 psi. Additionally, on page 19, lines 16-25, the instant specification teach that during the agitation step, the chamber is rapidly depressed. The specification doe not teach pressurizing the vessel with CO2 to a higher of two supercritical pressures while heating the vessel. The specification teaches one pressure. Similarly, during the agitation step, the vessel is not decompressed to the lower of two supercritical pressures. The specification fails to teach or suggest two higher supercritical pressures and two lower supercritical pressures.

4. Claims 7-11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification does not provide adequate written description for pressurizing the vessel at a higher of two pressures and agitating by decompressing to a lower of two pressures. Specifically, the specification fails to provide adequate written description for two higher supercritical pressures and two lower supercritical pressures.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 7-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 is indefinite because in step b, it is unclear what the skilled artisan would consider as the higher of two supercritical pressures. What are the two supercritical pressures and given two supercritical pressures, which one is considered the higher of the two? In step c, it is unclear what is meant by said higher supercritical pressure. Which of the two pressures in step b is "said higher supercritical pressure" in step c. Step d has similar issues. Specifically, what are the two lower supercritical pressures and given two lower supercritical pressures, which one is considered lower? Additionally how does the two lower supercritical pressures of step d differ from the two higher supercritical pressures of step b. Step d is indefinite because it is unclear how a rapid decompression results in agitation of the substrate. In step f, is the supercritical temperature the same supercritical temperature of step b? Claim 8 is indefinite for the same reasons similar to that of step c. Which of the two pressures in step b of claim 7 correspond to the "higher supercritical pressure" of claim 8. Claim 9 is indefinite because it is unclear what is meant by a processed and unprocessed substrate.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 7-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Davenhall et al. (6403544).

Davenhall teach a method of removing photoresist materials from semiconductor wafers by treating with a dense phase fluid in combination with at least one dense phase modifier. In reference to claim 7, Davenhall et al. teach positioning the wafer to be treated in a pressure process vessel 54. The high pressure-processing vessel 54 is maintained at sufficiently high temperature and pressure to keep the solvent mixture in a supercritical state. The limitations of heating and "without entering a liquid phase condition" are inherently met since Davenhall teach in col. 8, lines 10-30 heating at temperatures to maintain a supercritical state. Re step c, refer to col. 8, lines 45-50. Re step d, Davenhall teaches in col. 11, lines 25-30, pulsing the supercritical fluid mixture from high to alternating low pressures. Col. 8, lines 20-30 and col.11, lines 40-45 teaches that the pressure pulsing is accomplished by opening control valve 62 to release build up pressure in the high-pressure process vessel. In reference to the agitation, the limitations are met since Davenhall is performing the same method steps as the claimed invention. Specifically, Davenhall teach pressure pulsing and further teaches dynamic treatment, as described in Table 1. In reference to step e, refer to col. 8, lines 57-60 and col. 12, lines 60-66. In reference to step f, the limitations are inherently met since col. 10, lines 35-40 teaches depressurizing the wafer from the

process vessel after treatment. Additionally, in col. 12, lines 39-42, Davenhall teaches that a decrease in pressure causes the supercritical dense phase fluid to leave the vessel as a gas, therefore, the limitations of "without entering a liquid phase condition is met. Additionally, it is well known in the art, as evidenced by Namatsu (6576066) that if supercritical fluid is gradually discharged in a supercritical state, no liquid gas interface is formed, the CO2 does not liquefy, but gasifies, thereby drying the substrate surface. In reference to step g, refer to col. 10, lines 36-40. Re claims 8 and 9, Davenhall teaches pressure pulsing which reads on repeated steps, in addition to both static and dynamic treatment, as described in table 1. Additionally, col. 12, lines 59-60 teach repeating the number of pulses sufficiently to remove the photoresist. In reference to unloading, refer to col. 10, lines 37-40.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tseronis et al. (6508259).

Davenhall fails to teach an inverted vessel. Tseronis et al. teach an inverted pressure vessel for processing wafers for the added advantages of reducing the level of particle contamination on the wafer surface during processing. It would have been within the level of the skilled artisan to have modified the method of Davenhall to include an inverted pressure vessel, as taught by Tseronis, which offers the advantages of reducing the level of contamination on the wafer surface.

Re claim 11, Davenhall teaches pressurizing with CO2 and an additive. Davenhall fails to teach pressurizing with CO2 followed by CO2 and the additive. However, it would have been within the level of the skilled artisan to introduce CO2 followed by the addition of the additive to the vessel containing CO2 since Davenhall teaches a conduit with control valves to sequentially or intermittently direct a flow of only one dense phase fluid or a fluid mixture into the high pressure processing vessel. Additionally, it is notoriously well known in the art, as evidenced by Mullee (US2002/0048731) to pressurize the chamber with SCF CO2 followed by a fluid mixture of SCF CO2 and additive.

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Farme and Moritz r teach an inverted pressure vessel. Biberger et al. teach processing with supercritical CO2. Henriksen teach extraction of wood with

supercritical CO2. Chandra, Jackson, and Furukawa teach supercritical fluid processing.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharidan Carrillo whose telephone number is 571-272-1297. The examiner can normally be reached on M-W 6:30-4:00pm, alternating Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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bsc

SHARIDAN CARRILLO
PRIMARY EXAMINER